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The Managing Committee do not hold themselves responsible for opinions expressed by contributors.

Key to the more important Dicotyledonous families, met with in the Madras Forest College Camps.

(Based mostly on vegetative characters.)

By, Rao Sahib V. N. Seshagiri Rao, B.A., M.F.S.

"There is not so contemptible a plant or animal that does not confound the most enlarged understanding ...."

JOHN LOCKE.

This Key for the more important families of dicotyledonous plants met with in the Forest College Camps, is primarily intended for use by the students of the College, and is based as far as possible, on field characters which, require no more than a pocket lens for their recognition Once the family is ascertained, the genus and the species could be easily determined by reference to local floras like that of Mr. G. Viswanatham's (Curator, Madras Forest College) *Systematic Forest Botany for Madras.* I am conscious that, like all artificial keys, it will not prove infallible. I shall be more than satisfied if it brings to the student that preliminary knowledge of the

chief vegetative characteristics of the families which is so essential for the identification of trees in the forest.

My thanks are due to Mr. G. Viswanatham, for the valuable suggestions he made for the improvement of the key.

List of abbreviations used :—

Ls.	Leaves.
Simp.	Simple.
Alt.	Alternate.
Stip.	Stipulate.
Stips.	Stipules.
Nd.	Nerved.
Ns.	Nerves.
Fls.	Flowers.
Def.	Definite.
Indef.	Indefinite.
Fr.	Fruit.
Sup.	Superior.
Inf.	Inferior.

Trees and shrubs.

A. Ls. simp. † (51). [Exceptions in family Nos. 1, 11, 12, 55—See page 176].

a. Alt. (36). [Exception in family No. 21].

(a) Stipulate. (14).

1. Penni-nd. (9). [Exception in family No. 7].

(1) Margins entire (7).

i. Stips. spinescent. (3)

* Ovary on a long gynophore. ... *Capparidaceæ.* 1

** Ovary not on a gynophore; Stamens antipetalous, ls. usually 3-5 ribbed. ... *Rhamnaceæ.* 2

ii. Stips, not spinescent:

* Stips, minute, or 0. (6).

x. Glandular hairs and milky juice often present. Fls. uni-sexual, Ovary 3 celled. ... *Euphorbiaceæ.* 3

xx. Fls. bi-sexual, often in panicles; petals clawed and wrinkled, Fr. a capsule. ... *Lythraceæ.* 4

xxx. Fls. uni-sexual, dioecious; petals not clawed or wrinkled. Fls in axillary cymes or umbels, Fr. a drupe ... *Aquifoliaceæ.* 5

** Stips, large, enclosing the bud; resinous trees, calyx accrescent, Fr. usually winged. ... *Dipterocarpaceæ.* 6

† Such a number in brackets denotes the number of the first family beginning with opposite characters.

(2) Margins not entire. [Exception in family No. 7].

i. Leaves broad, dentate or serrate, stips. deciduous, seeds arillate, or with pulpy testa. ... *Bixaceæ.* 7

ii. Leaves bifarious, asymmetrical, sap watery. ... *Ulmaceæ.* 8

2. Leaves palmi-nd.

(1) Basal nerves 3. (10).

i. Ls. dentate, sec. ns. parallel and divergent; often wlth stinging hairs. ... *Urticaceæ,* 9

(2) Basal ns. more than 3.

i. Juice milky.

* Stips., large, sheathing, leaving an annular scar. ... *Moraceæ.* 10

ii. Juice not milky.

* Juice mucilaginous; hairs stellate.

x. Anthers one-celled, epicalyx often present, stamens monadelphous ... *Malvaceæ.* 11

xx. Anthers two-celled, mixed with staminodes, leaf margins variously incised, hairs tomentose. ... *Sterculiaceæ.* 12

xxx. Stamens generally free, androgynophore often present ... *Tiliaccæ.* 13

(b) Exstipulate:

1. Trees exuding juice:— (17).

(1) Juice milky; ls. coriaceous, clustered at the ends of branches, young parts rusty tomentose. ... *Sapotaceæ.* 14

(2) Juice blackish, acrid or resinous, Fls. panicled. ... *Anacardiaceæ.* 15

(3) Juice red; ls. often distichous and pellucid punctate, Fls. dioecious, seeds arillate. ... *Myristicaceæ.* 16

2. Trees not exuding juice :—

(1) Aromatic. (23).

i. Ls. pellucid punctate. (20).

* Pellucid gland-dotted, ls. unifoliate, petiole wingled ; armed. ... *Rutaceæ.* 17

** Pellucid dots often minute, Ls. bifarious, symmetrical, usually tomentose, staminodes present, Fr. capsule. ... *Samydaceæ.* 18

*** Ls. with glands pellucid punctate and streaked, stamens opposite and equal to corolla lobes; ovary sup. or half sup. ... *Myrsinaceæ.* 19

ii. Ls. not pellucid punctate.

* Ls. simple, petiole not winged with intramarginal nerve. ... *Myrtaceæ.* 20 (*Adult Eucalypts*).

** Ls coriaceous, evergreen ; Perianth enlarged in Fr. ... *Lauraceæ.* 21

*** Bark of branchlets marked by numerous longitudinal, anastomosing narrow ridges. Ls. more or less distichous, anthers overtopped by the truncate enlarged connective, endospern ruminate Fls. trimerous. ... *Anonaceæ.* 22

(2) Not aromatic.

i. Fls. hypogynous. (30).

* Ls. with prominent parallel, sec. ns, petiole dilated and sheathing at base,

calyx persistent. Fls. large, white or yellow, seeds arillate. ... *Dilleniaceæ.* 23

** Ls. scabrid or hispid. Blaze yellow, turning rapidly to a bluish black . Fls. often in scorpioid cymes : calyx persistent, style gynobasic, fr. nut. ... *Boraginaceæ.* 24

*** Ls. not scabrid ; Petiole not sheathing, bark usually black ; Calyx persistent and accrescent in fr. ; Fls. usually dioecious. ... *Ebenaceæ.* 25

**** Fls. bisexual, corolla urceolate, anthers opening by terminal pores. ... *Ericaceæ.* 26

***** Trees often spinescent :– Fls. bisexual; Ls. with silvery or brown stellate hairs. ... *Eleagnaceæ.* 27

****** Fls. large and showy, stamens indef., calyx peristent. ... *Ternstroemiaceæ.* 28

******* Fls. minute, Stamens 5, calyx not persistent ; Ls. often subverticellate. ... *Pittosporaceæ.* 29

ii. Fls. Epigynous.

* Ls. Pinnate-veined (35)

‡ Fr. Indehiscent.

x. Fr. winged or angled. ... *Combretaceæ.* 30

xx. Pericarp of Fr fibrous, succulent Fr, angled. ... *Lecythidaceæ.* 31

xxx. Fr. not winged or angled ; a cylindrical drupe ; Ls. often dry-

ing to a yellow. Stamens opp. the petals and indef. ... *Symplocaceæ*, 32

xxxx. Fr. achenes; Calyx pappose: Fls. in heads. ... *Compositeæ*. (*Vernonia*). 33

xxxxx. Fr. baccate; anthers opening by apical pores. ... *Vacciniaceæ*. 34

** Ls. Palmately veined.
Basal ns. 5, serrulate. Bole often buttressed; branchlets with prominent leaf scars. Fr. a capsule, ... *Datiscaceæ*. 35

b. Opposite.
(a) Stipulate, (41).
1. Stipules interpetiolar. (39).
* Ovary inferior. (38).
x. Petals united, not laciniate. ... *Rubiaceæ*. 36
xx. Petals free, laciniate; ls. coriaceous, shining, margin revolute. ... *Rhizophoreæ*. (*Carallia*). 37

** Ovary inferior.
Ls. often with 3-5 basal ns. ... *Loganiaceæ*. 38

2. Stipules not interpetiolar.
* Ls. coriaceous, stips caducous, Fr. a drupe or capsule, Fls. on regularly branched dichasia, with red aril. ... *Celastraceæ*, 39
** Seeds not arillate, petals clawed and wrinkled. Calyx persistent. Fls. often in panicles, ... *Lythraceæ*. 40

(b) Exstipulate.

1. Exuding sap. (43).

* Sap, yellow or greenish. Ls. shining, sec. ns. parallel and close. Petals free. ... *Guttiferеæ.* 41

** Sap milky, petals united, throat of corolla with corona, Fr. usually of two follicles, seeds winged or comose. ... *Apocynaceæ.* 42

2. Not exuding sap.

* Ls. with intramarginal nerve. (45).

x. Pellucid gland dotted, pennind., stamens indefinite. ... *Myrtaceæ.* 43

xx. Not pellucid dotted, usually with 3–7 basal ns. ... *Melastomaeeæ.* 44

** Ls. with no intramarginal nerve.

x. Anthers opening by valves, perianth accrescent, supporting dry or fleshy fr. Ovary sup. ... *Lauraceæ.* 45

xx. Anthers not opening by valves; perianth not accrescent, brownish purple; ovary inferior. ... *Santalaceæ.* 46

xxx. Ovary inferior, ls. and fls. usually emitting an unpleasant odour. ... *Caprifoliaceæ.* 47

xxxx. Corolla 2 lipped.

‡ Branches quadrangular, hairs glandular, style gynobasic. ... *Labiateæ.* 48

‡‡ Herbs or shrubs usually lineolate with prominent ra-

phides, swollen nodes, persistent bracts, seeds attached to retinacula. ... *Acanthaceæ.* 49

‡‡‡ Shrubs or trees, calyx persistent, often accrescent. ... *Verbenaceæ.* 50

B. Ls. Compound.

a. Alt. (62).

(a) Pinnate. (60).

1. Bark and ls. usually bitter. (53).

(1) Leaflets opp. filaments free Fr. a drupe or samara. ... *Simarubaceæ.* 51

(2) Leaflets usually alt., filaments united, Fr. usually a capsule. ... *Meliaceæ.* 52

2. Bark not bitter.

(1) Aromatic plants. (56).

* Ls. with pellucid gland dots. ... *Rutaceæ.* 53

** Ls. without pellucid dots.

x. Bark exuding balsamic resin. ... *Burseraceae.* 54

xx Bark yielding acrid blackish juice. ... *Anacardiaceae.* 55

(2) Not aromatic plants.

* Stipulate. (59).

x. Leaflets often stipellate, Fr. usually a legume. ... *Leguminoseae.* 56

xx. Stips, adnate, odd pinnate, leaf-margins not usually entire ... *Rosaceae.* 57 (*Rosa, Rubus*).

xxx. Stipules not adnate, Ls. spinous-toothed, stamens opp. the petals. ... *Berberidaceae.* (*Mahonia*). 58

** Exstipulate. Even-pinnate (often lyrately) leaf margin entire. ... *Sapindaceae.* 59

(b) Palmate.

1. Leaflets more than 3, petioles very long, stips. adnate to the petiole, stellate hairs ... *Araliaceae.* 60
2. Leaflets 3, petioles short, stips, not adnate. ... *Sapindaceae.* (*Allophylus*). 61

b. Opposite.

(a) Pinnate, odd pinnate. (66).

1. Stipulate (63).

(1) Stips. interpetiolar, leaflets stipellate, young foliage bright yellow. ... *Staphyleaeeae.* 62

2. Exstipulate.

(1) Unipinnate. (65).

x. Ls. branchlets and inflorescence rusty pubescent, panicles large, Bark dark brown. ... *Sabiaceae.* 63

xx. Leaflets, oblique, opp, Rachis swollen at insersion of leaflets, and nodes also, Fr. woody capsule, seeds winged. ... *Oleaceae.* (*Schrebera*) 64

(2) Uni, bi., or tripinnate.
Leaflets absent, posterior stamen reduced to a

staminode or O. Fr. an enlongated 2 valved septifragal capsule with winged seeds. ... *Bignoniaceae.* 65

(b) Palmate.

1. Ls. aromatic, 3–5, Fr. a drupe ... *Verbenaceae.* *(Vitex,)* 66

2. Ls. not aromatic, Leaflets 5–9, Fr. a capsule. ... *Sapindaceae.* *(Aesculus).* 67

EXCEPTIONS.

(*N.B.*—Exceptions relating to herbaceous or unimportant species are excluded).

Serial No.		Family No.	Notes.
1	...	7	*Hydnocarpus alpina* and *Bixa* (entire).
2	...	1	*Crataeva* (trifoliate)
3	...	11	*Bombax*, *Eriodendron*, and *Adansonia* (digitately compound).
4	...	10	*Celtis* and *Trema* of *Urticaceae* (3 nerved).
5	...	12	(i) *Sterculia foetida* (digitate by compd.). (ii) *Sterculia guttata* and *S. alata* (entire). (iii) *Heritiera.*
6	...	55	*Rhus* (3 foliate) *Odina* and *Spondias* (odd-pinnate, 7-13).
7	...	21	Some sp. of *Cinnamomnm* and *Actinodaphne* (opp.)
8	...	39	*Celastrus* and *Gymnosporia* (alt.)
9	...	42	*Thevetia*, *Plumeria.*

College-day, Madras Forest College, July 1st 1933.

The distribution of prizes and certificates to the twentieth batch of trained students of the Madras forest College took place on the 1st July, 1933, the concluding day of the 'Forest College Week.' The Hon'ble Dewan Bahadur, Sir M. Krishnan Nayar, Kt., the Law Member, presided over the function. The students of the College furnished a guard of honovr, which Sir M. Krishnan Nair, and Mr. A. Wimbush the Chief Conservator, inspected.

Mr. J. C. Wrench, the Principal opened the proceedings by addressing the gathering as follows:—

"The Hon'ble Diwan, Bahadur, Sir M. Krishnan Nayar, Mr. President, Members of the Board of Visitors, Ladies and Gentlemen.

"Allow me to convey the hearty welcome of the members of this College to you, Sir, on this your third visit to us. Your presence here among us to-day is, Sir, an obvious token of your interest in the welfare of this College, and for it, we offer you our most cordial thanks.

"In conformity with the usual practice I now proceed to make a short statement concerning the events of the past year:—

"The year has not been without its sorrow. In November last, one of our members died — a Junior student — Nanjunda, of Coorg, a good fellow, of the right type, and recently in May of this year, Mr. C. M. Belliappa, who up to the end of last year had been a member of the staff, for some years. His memory is so green among us that we cannot but feel his death other than affecting the College, too. To their relatives in their bereavement we tender our deepest sympathy.

"Changes in the Staff at the beginning of the year brought us two new members, viz., Mr. M. Kesavan Unni Nayar and Mr. V. N. Seshagiri Rao. Since then Mr. Seshagiri Rao had had the title "Rao Saheb" conferred upon him, I understand, for good work in the

remoter parts of the Vizagapatam Agency, and the College takes this opportunity to renew its congratulations.

"The year began with a total of 48 students: 19 Seniors and 29 Juniors. The Seniors were: 5 from Bombay, 5 from Central Provinces, 2 from Hyderabad, 7 State students, (Viz., Dharampur, Jobat, Dhar, Bhopal and Travancore), and one private student from Madras, Madura. After an interval of 4 years, we welcome to the College, Madras Government students. These number 12, obtained from the rank of Foresters. These men might profitably be younger in age but it is trusted that they will make the most of the opportunity given them. The other seven students are from Coorg, Bombay, Hyderabad, Bhopal and 2 private students from Madras.

"To anticipate: we expect about 28 students from the 1st of August next making a total of 56. The recruitment in the case of Madras Government students will be direct. Thus the wish of the Secretary to Government, Development Department, who presided last year, is likely to be fulfilled when he said, "We look forward to the revival of the numerical preponderance of of Madras students in the College.......... .. .."

"Forestry, Sir, is a profession with a technique and science all its own. The course of training which students undergo here is designed to fit them for their duties which will later be theirs. The course of training is both theoretical and practical and of the working days in the usual 365 about half is spent in the form room and half in the field. Further, students have the advantage of being taught by a staff of men who are themselves finding out. For, the Science of Forestry like other sciences is making progress. In addition to instruction by the staff: opportunity, chiefly found in the field, was taken for local officers to give to students formal and informal talks on subjects of particular local importance. The thanks of the College are due to these Officers.

"The general standard of health was fairly satisfactory. In January — February of this year 3 mem-

bers of the staff suffered from attacks of malarial fever; one to such an extent that a temporary substitute had to be appointed in his place.

"There was a fair amount of malarial fever among Junior students. This is explained to some extent by Madras students having served in the Department for some considerable time before coming to the College. Every effort was made to combat the disease by courses of treatment. It may be observed that with the exception of three, all Senior students show an increase in weight and this coupled with an active physical training programme.

"With regard to discipline: the beginning of the year found us with the majority of the Junior division made up of men from the Madras Service considerably older in age than usual. Such men could not but have found, at times, life at the College a little irksome, after their former freer life. I should like to thank them now for their co-operation and to point out once again that discipline is necessary in order to live a fuller common life.

"Before commenting on the result of the Examinations it is my painful duty to state that it has been necessary to dismiss a Senior student from the College for dishonest conduct in Final Examinations— a very deplorable ending to two years study.

"Eighteen students sat for the Final Examination; of these one secured an Honours Standard Certificate and 17 Higher Standard. The College would like to take the opportunity to congratulate the winner of the Honours Certificate, Indra Narayan Dube from Central Provinces. It is recalled that 3 years have elapsed since the award of an Honours Certificate to a student.

"The highest percentage of marks obtained in the Final Examination is 80.4 the the lowest 58% giving a class average of 70%. With regard to the examination in First Aid 19 students obtained certificate of the Saint John's Ambulance Association.

"The Junior division has done satisfactorily in their first year annual examination. The class average is 71% while the first student gets 84%. He is a Madras Government student.

"The College Debating Society which was started last year has done useful work. Several subjects of technical and non-technical interest were considered during the year. Under the auspices of the Society, Dr. T. V. Ramakrishna Ayyar Government Entomologist, Agricultural College and Research Institute, Coimbatore, gave a lecture on Entomology. Dr. Patel P. HD., of the same institute on "Study in Foreign countries." Both lectures were much appreciated and we count ourselves fortunate in being situated so near this Institution.

"A forester's life, Sir, involves strenuous physical exertion and any review of the professional studies at the College would be incomplete without reference to physical training with its valuable lessons of self control and resources. Games form a compulsory and important part of the College curriculum. They are organised and controlled by the College Athletic Club. Office bearers are drawn from members of the staff and from students. Games are held three afternoons a week in Headquarter terms. They comprise, hockey, cricket, athletics, tennis and this year due to increase in numbers association foot-ball.

"From hockey, cricket and athletics we have derived much recreation and pleasure. It is always rather a matter for regret that owing to our camping periods, it is hardly possible, for a number of reasons to to develop a college team to its full proficiency.

"In hockey in October last the College entered the local Athletic Association Hockey Tournament, and reached the semifinal. During the course of the year the College had nine fixtures with outside teams, of which five were lost and four won. In College Hockey Sixes, six teams participated.

"In cricket the College entered the local Y. M. C. A. Tournament but were beaten in two out of three matches.

With outside teams eight matches were played, five lost, two won and one drawn. Many of the juniors of this year were introduced to this game for the first time.

"The athletic activities were, the Grigg Sports (open events August 1932), the College Annual Sports (October 1932); the First Coimbatore Olympic Sports (February 1933) and the Annual cross country race (March 1933).

"In the Grigg Sports in August last, the College won the aggregate cup for open events for the third successive year, and also the Individual Championship Medal, also for the third successive year. Unfortunately upon enquiry we were told that the cup could not be won outright. But we are content with the honour. The College Athletic Sports were held in October, under favourable conditions and were well contested. The Richmond cup for the highest aggreate score was won by a Senior Student: The Coibatore Olympic Sports were held in February. The College entered for 14 events and were represented in the finals in 9, the aggregate Championship Shield being well won, by the Government College. The Cross Couutry Race was won by a Junior student and he is to be congratulated on a well sustained effort. Other sports and physical training at the College need no special mention.

"The estimate for electrification of the College and Estate has been sanctioned and we expect electricity to be installed by the end of this financial year.

"The question of supply of good water to the College seems solved by completion of the Siruvani scheme, when it is hoped, the College will be included in the area supplied. The question is under correspondence.

"The College loses the service at the end of this term, of Mr. Ramachandra Rao who, after leave, returns to other duty. Mr. Ramachandra Rao has been associated with the College for 4 years, and I willingly take this opportunity to refer again to his unfailing interest and co-operation in College work and life and to thank him here,—publicly.

"Before calling upon you, Sir, kindly to present the certificates and prizes, I would ask those students, who are leaving us to remember this College; to remember and to maintain any friendships they have made here: also to remember that certificates of proficiency are not an end in themselves: Finally, Sir, on behalf of the staff and students, I again thank you, for presiding here to-day. I now request the President to present the certificates and prizes:—"

List of passed students arranged according to marks.

Honours :—

1. Indra Narayan Dube.

Higher Standard :—

2. Jageshwar Chintamen Sarwate.
3. Vijai Shanker Bihari Lall Sahu.
4. Kilimanoor Rama Varma.
5. Azzullah Sidiki.
6. Shankar Vithal Gulwadi.
7. Kunwar Narpat Singh.
8. Narayan Dattatraya Kalbag.
9. Bhimrao Vithal Patil.
10. Shafique Ahmed Farid.
11. Prabhakar Narayan Mulay.
12. Narayana Pillai Velayudhan Nair.
13. Himatsingh Urmedsingh Dasondi.
14. Abdul Ahad Khan.
15. Mohammed Saleh.
16. Thakka Ramaswamy Iyer Rajagopalan.
17. Ganesh Dattatraya Saranjame.
18. Mohammed Ahmed Khan.

Prizes.

1.	Gold Medal for the best Senior student on marks	Indra Narayan Dube.
2.	Silver Medal for Honours....	Indra Narayan Dube

3.	Campbell-Walker Prize for the best student in Forestry. (In Final Examination	Indra Narayan Dube.
4.	Lodge Prize for Engineering	Indra Narayan Dube.
5.	Madras Conservators' Prize for Survey and Drawing (in Final Examination).	Indra Narayan Dube.
6.	Madras Conservators' Prize for Botany (in Final Examination)	Indra Narayan Dube Jageshwar Chintamen Sawate.
7.	Madras Conservators' Prize for Range Administration	Indra Narayan Dube.
8.	Brazier Prize for the student likely to make the best outdoor Ranger	Jageshwar Chintamen Sarwate.
9.	Chief Conservator's Prize for the best Junior Sudent.	C. Sreedhara Mannadiar.
10.	Richmond Cup to the student obtaining the greatest number of points in the more important events at College Sports	Jageshwar Chintamen Sarwate.
11.	Pentland Shield for the all-round athlete	Jageshwar Chintamen Sarwate.
12.	Fischer Cup for Tennis	K. Krishnamurthi.
13.	Mannarghat Moopil Nayar Cup for Cross county race....	N. C. Madappa.
14.	Cowley Brown Cup for Inter-divisional Hockey	1932-34 Division (Junior).
15.	Hockey Sixes	(1931-33 division).

1. Jageshwar Chintamen Sarwate,
2. Himatsing Urmedsing Dasondi.
3. Prabhakar Narayan Mulay.

(1932-34 division).

4. M. S. Subbiah.

5. K. M. Atchayya.
6. C. B. Ekambara Mudaliar.

16. Swimming Medal .... M. Narayana Nambiar.

17. Winner of the best essay in the Madars Forest College Magazine for the year 1932-1933. Shankar Vithal Gulwadi.

18. Debating Society :-- Shankar Vithal
Prizes—Extempore .... Gulvadi.
,, Prepared .... Azzullah Sidiki "

After the distribution of prizes, Sir Krishnan Nair made a speech in the course of which, after congratulating the staff on the efficient working of the College, he said that till recently the very existence of the College was hanging in the balance. For some time past, owing to the existence of many supernumerary rangers in the Dept., and in view of the fact that the reorganisation of the Dept, was under the consideration of the Government, very few of the Madras candidates were selected for training in the college. As a matter of fact, no Government students were deputed for training for 1930-32 and 1931-33 courses. The college was therefore working at less than its proper strength and the question was raised whether it was necessary for this Government to retain this institution for the benefit solely of other provinces and some of the Indian States. The question of the closure of the college was therefore carefully examined by the Government and it was fiually decided that the institution must be retained. For the 1932-34 course, the Government had deputed 21 students selected from the ranks of Foresters. In future Foresters would be eligible for promotion to the grade of rangers up to a limit of 5 per cent of the rangers' cadre. The rangers' class in the Dehra Dun College had been temporarily closed by the Government of India and this college in Coimbatore was the only instituion of its kind now functioning in the whole of India. This college might be expected to work the full complement of students in future and it might definitely be hoped that

a new era of activity was in sight for this institution. There was a standing grievance among the Rangers, namely, that there had been no promotion from their ranks to the gazetted ranks for a long time. It might be possible to redress this grievance, when as it was expected recruitment to the grade of the Madras Forest Service was shortly re-commenced and when the question of the future method of recruitment to this service was finally decided. As their Principal had said in his report, an estimate for more than Rs. 30,000 for the electrification of the college and the estate had been sanctioned and when electricity was installed the amenities of college life, he need not say, would be considerably improved. He wished this institution, its staff and students luck and prosperity in the coming years.

Mr. A. Wimbush, the Chief Conservator of Forests then made the following speech;—

" Sir Krishnan Nayar, Principal of the Forest College, Ladies and gentlemen,–I have much pleasure in reiterating the words of welcome to the Hon'ble Law Member expressed by the Principal. The Forest Department appreciates the interst which he takes in it and its members, as shown by his readiness to come here today at considerable personal inconvenience, in order to preside at our College Prize Distribution for the third time during his tenure of office.

" The Principal has referred to the fact that in the study of Forestry students have the advantage of being instructed by a staff of officers who, themeselves, are still learning. One of the chief fascinations of a Forest Officer's profession lies in the fact that he has the opportunity of learning something new on almost every occasion on which he visits his forest.

" Our object at the Forest College is not only to impart knowledge of the fundamental principles of forestry but also to train students to use their powers of observation, which are often dormant, in order that, after leaving the College, they may be in a position to continue their studies throughout their service.

"The final examinations at the Forest College are held by Forest Officers with years of practical experience in the forest. These officers hold both written and oral examinations, and I wish to thank them for the trouble and care which they have taken in arriving at a true appreciation of the knowledgs of the students. At least three of the Examiners with previous experience of examining at the College are of opinion that the general standard of the outgoing class is rather below the average, although a study of the mark lists of ths past 4 years would give the opposite impression.

"I have been very pleasantly impressed by the rejuvenating effect which a spell at the Forest College has already had upon the members of the Junior Division. Many of the Junior students had put in years of hard work in the department before they were deputed to the College last year and due to exceptional circumstances which will not recur, some of them were well over the normal age for entry to the College. After seeing these men beating their seniors in a very evenly contested hockey match last monday I no longer have any fears of their being too old to put in the allotted years of useful service in order to justify their deputation to the College.

"I now have to refer to a less pleasant subject. The Principal has told us that he had to dismiss a senior student for cheating in one of the final examinations. I suppose that what is commonly known as "cribbing" has existed ever since examinations were invented. When a boy has been detected in the commission of this offence it is not unusual for a person in some position analogous to mine to deliver a lecture on the extreme wickedness of the practice and to point out that a boy who could be guilty of such an offence must necessarily be capable of committing any sort of crime in after life. In point of fact this is not necessarily the case and in talking to you students to-day I do not propose to appeal solely to your sense of right and wrong though I hope that the majority of you will realise what a dirty trick it is to try to make yourself out to be a

better man than you are by cheating. You are perhaps more likely to be influenced by the practical aspect of the matter, since you are still comparatively young. Cribbing demonstrates extreme folly and the taking of an altogether unjustifiable risk. It brings disgrace and unhappiness not only to the person who practises it, but also to his family. The results of taking this most foolish and quite unnecessary risk are apparent to you to-day. A student has been caught cribbing and he has been dismissed. The rest of you are advised to give this fact and all that it implies most careful thought and to realise that this is one of the things which will not be tolerated at the Madras Forest College.

"Another piece of advice which I wish to give to you to-day relates to the question of health. The health of a normal Forest officer is much less a question of chance and depends much more upon the commonsense of the officer himself than is usually realised. Perhaps malaria and chills are the commonest serious ills to which Forest Officers are exposed. You all know the cause of malaria and the wise man will take ordinary precautions to avoid being bitten by mosquitoes. One way of doing this is to wear trousers, and cheap, loose long boots of canvass or soft leather in the evening instead of going about in shorts or a dhoti with bare knees or legs. Wearing a thin coat instead of going in shirt sleeves is also advisable after dark. As for chills the following story told me as a personal experience by a senior member of our service will probably impress itself upon your minds. These officers, one an old experienced hand, one a man with a certain amount of service and the third a newly joined assistant returned to their motor car very hot and wet after an inspection. The most experienced of the three changed his wet shirt for a dry one, the second put a coat on and the young assistant, in the extreme folly and ignorance, got into the car as he was, thinking to keep cool. Before the end of the drive the last named had caught a first class chill and was very ill.

"In conclusion I wish to say a word or two about your Principal. Mr. Wrench has been at the Forest

College for more than 3 years. During that time he has worked whole-heartedly for the good of the College. He is now proceeding on well earned leave and I am sure that you will all join me in wishing him and Mrs. Wrench a very pleasant time at home and a safe return to renewed activities."

The gathering then adjourned for a tea party given by the Board of visitors, the Principal and staff of the college, and the function came to a close.

Prize "Howlers".

Amusing mistakes from the schools.

The following are among the " howlers " published in the *University Correspondent* for January as having been received in response to an offer by that publication of a prize for the best collection of 12 amusing mistakes by school children.

(*The Times—1928*).

1. The King wore a scarlet robe trimmed with vermin.
2. The whole world except the United States lies in the temperance zone.
3. Wolsey saved his life by dying on the way from York to London.
4. The masculine of " vixen " is *vicar*.
5. Henry VIII was very cruel to Ann Boleyn and ironed her. (The text book says " he pressed his suit on her. ")
6. A fissure is a man who sells fish.
7. Algebraical symbols are used when you don't know what you are talking about
8. The mechanical advantage of a long pump-handle is tha you can have someone to help you pump.
9. *Genae puellae formosae sunt.* – Beautiful girls are cheeky.
10. *Emporte par la colere.*—Carried off by the collar.

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EXTRACTS.

1. Wild Elephants' Havoc :

Bill to Grant Licences to shoot them.

The Government have the intention of introducing a Bill to amend the Madras Wild Elephants Preservation Act of 1873 with a view to take power to grant licences to named persons subject to suitable conditions and restrictions to shoot at or destroy wild female elephants in specified areas.

The following is from the statement of objects and reasons of the proposed bill: Licences to shoot wild male elephants can be issued under Section 7 of the Madras Wild Elephants Preservation Act of 1873. Section 3 of the Act prohibits the shooting at or destroying of wild female elephants except where such shooting or destruction is necessary for the protection of life or property. It has been reported that the number of elephants has much increased, notably in the Coimbatore district that they do a great deal of damage and that the killing of male elephants only is insufficient to keep down their numbers Section 6 of the Act is of little use since the ordinary cultivator whose life and property are threatened seldom possesses adequate weapon. It is, therefore, desirable that power should be taken to destroy wild female elephants also in areas where circumstances make such destruction necessary while imposing at the same time proper safeguards. It is accordingly proposed to amend the Act by enabling the grant of licences to named persons subject to suitable conditions and restrictions to shoot at or destroy wild female elephants in specified areas. The opportnnity has been taken to amend Section 4 to make it clear that no licence is required for persons such as gun-bearers or trackers who assist licensed persons to shoot wild male elephants.

—*The Hindu, 29–3–33.*

2. Plywood used in moving pictures :

There is a steadily increasing volume of California pine and Douglas Fir plywood used in the production of moving pictures at Hollywood, California. In round figures around 1,000,000 square feet of plywood, mostly thick stock is consumed in Hollywood in a year. Plywood is strong, light, stays in place, is easily shifted, may be used time after time. is readily papered over and, when properly braced, does not produce

reverberation. There is also a growing tendency to employ fancy hardwood-faced stock for rich interiors.

—*The Timberman, Jan. 1933.*

3. Nitrogen-Uptake of Plants:

Progress, due to the abandonment of traditional beliefs, is occurring to-day in agriculture as well as in other branches of applied science. At one time it was generally held that ammoniacal nitrogen had first to be converted into nitric nitrogen before it could be taken up by plants, but we now know of many plants that take up ammoniacal nitrogen directly; and at the present time doubt is being cast on a doctrine which has persisted since the days of Liebig and Boussingault, namely, that organic nitrogen has first to be 'mineralised' before it becomes available as food for plants. The work done by Prof. A. I. Nirtanen and his collaborators during the past few years has provided important evidence that at least some plants directly and readily assimilate organic nitrogenous compounds.

Earlier experiments showed that certain legumes, for example, red clover, did not grow so well when the nitrogenous food derived from the root nodules was replaced entirely by ammonium nitrate, but that peas utilised both forms of nitrogen equally well, whilst white clover responded better to ammonium nitrate than to the food provided by the nodule bacteria. These and other observations led to the hypothesis that legumes take up their nitrogen from the nodules in the form of organic compounds, and that these compounds constitute the best form of nitrogen nutrition for certain legumes. It was also found that these compounds diffuse into the surrounding soil, from which they are taken up by growing plants, like *Gramineæ*. Both pot and field experiments have shown that, when the *p*H of the soil does not fall below 6, one pea plant can provide sufficient nitrogen for two oat plants, but if the ratio of oats to peas is greater than two to one, both plants suffer from lack of nourishment.

Investigations were then made using sterilised sand and pea seeds inoculated with nodule bacteria, and it was found that the nitrogenous matter that diffused into the sand consisted entirely of organic compounds, which were almost equal to the nitrogen compounds directly taken up from the nodules. It was also established that nitrogen compounds diffuse into the soil from young and fresh root nodules of the alder tree, thereby enabling the latter to assist the growth of other trees.

Analysis of the substances that diffused into sterile quartz sand from the roots of pea plants that had been strongly inocu-

lated showed the chief constituent to be amino-acids: in percentages of total nitrogen, amino-nitrogen 77 .4, ammonia-nitrogen 0, amido-nitrogen 3.30, nitrogen in volatile bases 2.73, humin-nitrogen 2.05.

The question then arose whether non-legumes could take up and utilise these nitrogen compounds directly, and to solve it pea and barley plants were grown together in sterile sand contained in three-necked Woulff bottles, the pea seeds being inoculated, and each kind of plant being made to grow out through a neck of the bottle. The nutrient solution used contained no nitrogen. The barley plants grew excellently, but in the control experiment, in which the pea seed was not inoculated, they failed to grow. It was also found that barley, as well as peas, grew exceedingly well right up to the flowering fruiting stage when they were fed with an aqueous extract of a low moorland soil that contained no ammonia or nitric nitrogen; they also grew well when they were fed in sterile culture with peptone (Witte) as their sole source of nitrogen. It is therefore concluded that higher plants can take up and utilise directly organic nitrogen compounds present in soils before their nitrogen is mineralised by bacteria or other micro-organisms.

The nature of the organic nitrogenous compounds that are of value to plants, as well as their percentage utilisation, is now being investigated. Earlier experiments in which red and white clovers were grown under sterile conditions inside glass flasks showed that red clover responded well to hydrolysed casein and to aspartic acid, and less well to ammonium salts and nitrate, whereas with white clover the results were exactly opposite. In these experiments the hydrogen ion concentration of the nutrient solutions containing hydrolysed casein and aspartic acid remained constant, showing that the nutritional effects were due to the amino- acids themselves and not to ammonia that might be liberated by their decomposition. The later experiments, in which the plants were grown with their roots in sterilised nutrient solution or sand and their upper parts in the air, have shown that aspartic acid is a very good nutrient for legumes, but not for *Garmineæ*, and that asparagin is excellent for barley but much less good for *Leguminosæ*.

The manner in which the plants utilise such organic compounds can at present only be conjectured. On one hand, it may be that certain enzymes liberate ammonia from these organic compounds when they are still in the root system, and that the plants utilise the ammonia to synthesise protein. On the other hand, it is also possible that the amino-acids may be utilised directly for the synthesis of protein. —*Nature, April 15, 1933.*

4. On the fixation of Atmospheric Nitrogen by Bacteria Living Symbiotically in Root Nodules of Casuarina equisetifolia:

It has been known for over thirty years that many species of Casuarina have enlarged tubercles on their roots not unlike those of alder and leguminous plants. These tubercles or nodules contain bacteria which closely resemble the *Bacillus radicicola* of leguminous plants, but, though the nodules can be produced on Casuarina roots by inoculation from other Casuarina nodules, no such inoculation has been found possible from leguminous roots.

The experiments which Mr. Aldrich-Blake undertook while on a comparatively short stay at Dehra Dun, U.P., India, were devised to show whether the presence of nodules on the roots of Casuarina assisted in the supply of nitrogen to the plants. For this purpose he grew Casuarina seedlings, which were free from nodules and infected some with extract of nodules. Others he grew with a supply of ammonium nitrate, and the controls had no such supply at all. The result was that the shoots of the infected seedlings grew so much faster than the controls that their average weight was fifty times as great. The plants supplied with ammonium nitrate had shoots which were nearly three times as great as the controls. This shews that the presence of nodules is of immense benefit to the plant, and that even an artificial supply of ammonium nitrate cannot adequately replace them.

He also showed that the relative weight of root to shoot was very greatly reduced when nodules were present. So far was this the case that in the main crop the plants with nodules had roots which weighed 41 per cent of the weight of the shoots, whereas in the controls the weight of the roots was 138 per cent. of the weight of the shoots. In this respect also the plants receiving ammonium nitrate were intermediate.

The results are carefully tabulated with their standard errors so that anyone who is used to experimental work can assess the significance of the figures. From a practical point of view the research is valuable as showing the importance of obtaining the appropriate bacteria when Casuarina is grown. The importance of Casuarina is partly as a host for the sandalwood tree, which is parasitic on its roots, and from this fact the research derives an important secondary significance.

—*Quarterly Journal of Forestry. April 1933.*

5. Insect Pollinators of Orchard Trees:

The sterility of fruit trees is a widespread evil. One sees many unproductive trees, especially in small orchards, in all

parts of Great Britain. Many of the factors which affect sterility, such as genetic constitution, the nutrition of the tree and the influence of the grafted stock, are being investigated in several research stations. Mr. G. Fox Wilson has studied the actual mechanism of pollination as effected by insects. ("Pollination in Orchards", *J. Roy. Hort. Soc.*, 58 pt. 1, 125–138 Feb. 1933). He describes many species of insect visitors to hardy fruit trees. and, in the paper under review, outlines the pollinating habits of some of them. Many valuable suggestions are given for the planning of the orchard so that maximum pollination may result. It is shown, for example, that humble bees will not visit currrants and gooseberries planted in the neighbourhood of cherries. Many of the wild species of pollinating insects visit the edges, but not the centre of a large orchard, and it is recommended for the fruit-grower to make quite sure of fertilisation by placing hives of bees here and there amongst the trees. *—Nature, 9–5–33.*

6. Malaria Control :

An important step towards wider control of malaria was announced by the Ross Institute in its annual report in which it mentions the introduction of efficient standardised antimalarial oil available throughout the Empire for oiling the surface of mosquito-breeding grounds. The new standard mixture kills all larvae within fifteen minutes, some species within four minutes. The report explains that this result has been made possible by the research work conducted by the Indian branch of the Institute and the scientific staff of the Burmah-Shell and associated companies. The efficiency of the oil has been traced to certain chemical constituents the proportions of which vary widely in normal oils and can be largely increased. A number of new anti-malarial drugs have also been tested and sera has been prepared against some twenty strains of tropical bacteria. The report emphasises the importance which lay in the interest in malaria control, and reveals that the Institute uses the physical features of Wimbledon Common and Richmond Park, the centre of London's suburbia, to teach students where tropical houses should be built and coolie lines placed.

—The Hindu, 8–5–33.

7. Lac Industry in India :

Researches in Indian Institute of Science.

Scientific researches of fundamental importance holding possibilities of practical application to the advancement of agriculture and industry in India, have been carried on in the Indian Institute of Science, during the past year.........

Since 1929, Mr. M. Srinivasaiya and his co-workers have been investigating the possibilities of producing different lac products under Indian conditions. Their efforts have already met with a considerable measure of success and it may be interesting to note here, some of the more important products prepared by them together with a brief statement of their possible applications ; (1) A shellac varnish useful for impregnating transformers, magnet coils, armature windings, etc. Nearly 40 transformers have already been impregnated and baked in the bio-chemical laboratory and subsequently tested by the Mysore Electrical Department. The reports so far obtained are stated to be satisfactory ; (2) A special type of oil varnish incorporating lac suitable for impregnation of wooden pins and other moisture absorbing materials which are used in the electrical department. This varnish can be used for baking purposes and offers immense possibilities of application in general varnish trade ; (3) pigmented lacquer enamels have been prepared and used by the Mysore Public Works and Railway Departments. A few cars have also been sprayed with lacquer. They have so far withstood weathering for over a year.

In colloboration with the Mysore Electrical Department, attempts have been made to prepare different mould articles used in electrical trade and a number of promising compositions with lac as the chief binding material have been prepared.

Some of the above products are now being produced on a commercial scale by an enterprising local firm—The Mysore Scientific Instruments Syndicate.

Waste Products of Lac Industry.

A preliminary examination of the physiological products of the lac insect present in the factory wash liquor, by Mr. N. K. Ranga Rao has shown that the polypeptides present in it are very rich in arginine and histidine,. The nitrogenous bodies have been fractioned into an albumin and a serum consisting mainly of simpler polypeptides. The albumin is allied in composition to vegetable globulins, while the serum polypeptides consist of protaminlike bodies closely related to one isolated by Dunn, from the testicles of Sardinia. The serum polypeptides have been fractioned into six different groups of compounds of which three have been separated as solids, two as barium salt and the other as pure tyrosine. Two of the solids have now been analysed and are found to be rich in histidine fraction, containing 20 and 16 per cent. respectively of that ingredient out of a possible total of 41 and 26 per cents, respectively of basic nitrogen. Chemical examination of the other products as

also the investigation of their possible applications are in progress.

Mr. K. S. Varadachar has undertaken the standardisation of a method for determining the distribution of nitrogen in plant materials, particular attention being paid to the precipitation of humin which was found to be the chief source of error ln most cases.

Working with the bark of Cassia auriculata, Mr. N. Srinivasan has developed a simple refractometric method of estimating tannin present even in small quantities of bark or tanning extract. Close correlation between tannin content and refractometric reading has been found and evidence obtained to show that the method can be extended to other tannin bearing materials as well. —*The Hindu, 13–6–33.*

8. Spike Disease in Sandal :

Conference at Bangalore.

The experiments conducted and the investigations that are being made at the Indian Institute of Science in regard to the eradication of the spike disease in sandal, were reviewed on 25th April at a conference of the representatives of the Governments of Madras, Mysore, Coorg and the authorities of the Indian Institute of Science. Doctor Sir C. V Raman, Director of the Institute, presided on the occasion.

The first item on the agenda was the consideration of the progress made during the year. On behalf of the Central Spike Working Committee, Mr. M. Srinivasiah gave an outline of the researches conducted in the laboratories and the nurseries attached to the Institute and also the experiments conducted under sylvicultural conditions in the North Salem Forest areas. Particular stress was laid on the observations made on sandal plants which were either infected with sap and other diseased plants or were given minute sub-lethal doses of infected material. These plants showed no symptoms of the disease, but on being subjected to later grafting to the diseased tissue, resisted infections, for similar plants which had been originally left untreated rapidly succumbed to the disease. The observations pointed to the possible minimisation of such sandal by previous administration of minute doses of the infective principle. Another observation of importance was the finding of the sandal plants which were found to be naturally resistant to artificial infection. These plants, the resistance quality of which were tested repeatedly in the laboratory had been transferred to healthy infected areas and forests and although it was one year since they had been planted, they had not so far shown symptoms of the

disease. This type of auto-genic resistance has been sought to be found with the form of the seeds from which the plants were derived Careful examination of seeds from different localities including the Timor Island, said to be the original home of sandal, revealed marked variations with regard to the make-up of the seeds. Experiments on the natural resistance of the plants raised from seeds showing different physical characteristics were in progress.

Investigations on the entomologieal side conducted by Mr. Cedric Dover of the Forest Research Institute, Dehra Dun, had brought out several interesting features, though all attempts at experimental transmission of the disease from the agency of insects, have not so far been successful. Hundreds and thousands of insects breeding on sandal and associated with sandal areas particularily where the disease incidence is high had been collected and identified. The possibility of such insects either singly or in groups or in whole masses, transmitting the infection from the spike to the healthy plant were also actively in progress. One of the insects, Accropana Walkerii, produced marked corosses, shortening of the internodes and such like symptoms on healthy plants, after previous feed on the spike plant but the significance of the observation in relation to sandal spike had yet to be verified.

Experiments on the production of a cheap substitute for the costly tree-killers on the market, were also in progress and a composition containing arsenic with alkaline in useful proportions and produced in the laboratories at the Institute, had been found to be a comparatively cheap product.

The various observations mentioned above were discussed in careful detail with special reference to their extension in the forests. Various difficulties were mentioned and it was agreed that although the observations were highly suggestive, further work on a practical scale should be carried out to enable forest officers to adopt them in their regular practice.

—*The Hindu, 27-4-33.*

9. Spike Disease in Sandal :

Sandal has long been a valuable forestry product in southern India and the mysterious disease termed 'spike' has been the subject of investigation during the past quarter of a century. Various bodies interested in sandal are collaborating such as the Madras Forest Department, the Indian Institute of Science at Bangalore, the Forest Research Institute at Dehra Dun and others. A report on the progress made during the half year ending September 30, 1932, entitled " Investigations

on the Spike Disease of Sandal" has been issued by the Institute of Science, Bangalore. The sporadic attacks of this pest have a strange parallel to those of foot and mouth disease in Great Britain. A recrudescence of the disease in an epidemic form has been noticed in the Beedamaruthupatti spike area. Pollarding which has been carried out on a fairly large scale in the Galigattam and Manchi areas, has yielded significant data. So far, Manchi has the maximum percentage of disease-making sandal plants. The entire freedom from infection of a few areas, Sanamavu and Thalli in North Salem and Chickabettakere in Coorg, has been established by pollarding. More detailed technical contributions will appear as scientific papers in the *Journal of the Indian Institute of Science*, *Dehra Dun Forest Research Publications*, and elsewhere Meanwhile it is a valuable departure to issue progress reports so that the various investigators studying the pest, which causes so heavy a financial loss, should have early news of any results achieved.

—*Nature, 20–5–33.*

Departmental Notifications.

11—3—33. Consequent on the reversion from Foreign service of Ranger T. S. Ramalingam Ayyar. Seventh Grade, the following, reversions are ordered with effect from 1-3-1933.

(1) Mr. V. Viraswami Nayudu from the Seventh Grade sub protem to the Seventh Grade temporary. (2) Mr. M. P. Halasaynatha Ayyar from Ranger Seventh Grade temporary to Forester First Grade.

1—5—33. *With effect from 3-2-1933 vice Ranger N. K. Sarma, Second Grade retired from Service.*

(1) Mr. Henry Mac Bride from Third Grade permanent to the Second Grade (temporary)

(2) Mr. M. R. Duraiswami Ayyar, from the Fourth Grade permanent to the Third Grade (temporary).

5—6—33. The promotion of Ranger P. K. Subbanarayana Ayyar, ordered in the proceedings above, is cancelled, and in his place Ranger S. Nageswara Ayyar will be promoted to the Sixth Grade sub protem from the 5th November 1932 to the 31st December 1932.

Waltair Circle.

2—5—33. Mr. C. G. Krishna, Ranger III Grade, Lower Godavari division, (Gokavaram Range) appointed as Senior Instructor, V. T. School for the 1933 V. T. S. Session commencing from 1·6-1933. 2. Mr. V. Rangachari, Forester I Grade (and acting Ranger, Kukuluba Range) appointed as Junior Instuctor, V. T. S. for the 1933 session.

30—5—33. Mr. M. Subbarao, Ranger V Grade on exqiry of leave, posted to Cherla Range, Upper Godavari Division. 2. On relief by No. 1. T. Naganna, Forester, II Grade will revert as Forester in the same division.

31—5—33. A. Narasinga Rao, Forester Second grade, Parlakimidi division posted to Berhampur range, Ganjam division to relieve ranger A. Suryarao Naidu of additional charge.

16—5—33. On return from leave on 25-5-1933. Mr. N. Chakrapani Iyengar. Ranger Sixth grade, posted to charge of Kukuluba range, Ganjam District. 2. On relief by No. 1 Mr. S. A. Dawson, Ranger, Fourth grade, S. P. T., is transferred to Upper Godavari division to Nugur range.

Bellary Circle.

17—4—33. Mr. D. V. Nagaratnam acting Ranger Seventh grade on special duty, Kurnool South division posted to Bairluty range, Kurnool west division.

27—4—33. Mr. N. C. Nahadevan Pillai Ranger Second grade, Kadiri range, Anantapur division granted leave from 21-3-33 to 26-5-33 both days inclusive.

3—5—33 Mr. B. Kristna Rao, Ranger Sixth grade, on expiry of his leave on 6th May 1933 posted to Kadiri range, Anantapur division to relieve Mr. Sundaresa Ayyar Range officer, Madanapalle who is in additional charge of Kadiri range.

8—5—33. Mr. N. C Mahadevan Pillai Ranger, Anantapur division on expiry of his leave on 27th May 1933 posted to Sidhout range, Cuddapah north division.

2. Mr. B. Gulab Singh trained forester, Sidhout range, on relief by No, 1 will revert to his permanent post of Forester I grade and remain attached to Cuddapah North division until further orders.

24—5—33. Abdul Rahim Kahan, attached to Vempalle range, Cuddaph North to be Range Offiicer, Kodur. 2. S. Sankaran, Range Officer Kodur on relief by No. 1 to be on special duty in South Cuddapah division for checking staudards in Coupes I, II and III of Gazukuppa felling series and Coupes I, II and III of Kothulakuppa Felling Series in Kodur range. 3 A. Vyasulu Range Officer Markapur, Kurnool East to be on special duty in South Cuddapah division for the checking of standards as ordered for No. 2. 4. S. Varadarajulu Reddy Range Officer Dornal will take additional charge of Markapur during the deputation of No. 3. Nos. 2 and 3 will submit a joint report to the D. F. O. South Cuddapah. Their Head-quarters will be Cuddapah.

25—5—33. Mr. B Gulab Singh, M. R. H. trained Forester, Sidhout Range, Cuddapah North division, on relief by Mr. N. C Mahadevan Pillai posted to Yerragondapalem range, Kurnool East division. 2. Mr K. Purushothama Rao Ranger Sixth grade, on relief by No. 2 granted leave on average pay for 4 months.

31—5—33. Mr. N. C. Mahadevan Pillai Ranger, Second grade, Anantapur division granted extension of leave for 1 month 3 days from 27th May 1933 to 29th June 1933 both days inclusive.

14—5—33. Mr. G. V. Subba Rao, Ranger Sixth grade Nandyal range, Kurnool West division granted leave on average pay for 4 months from the date of relfef. 2. Mr. A. Muthukrishna Mudaliyar, Ranger Fifth grade, Kurnool West division, on expiry of his leave on 28th May 1933 posted to Nandyal range.

12—6—33. Mr A. Muthukrishna Mudaliar, Ranger Fifth grade Kurnool West division granted extension of leave on average pay for one month from 28th May 1933. He will join in Nandyal range on expiry of the leave.

12—6—33. Mr. T. K. Ramaswami Ayyar, Ranger Second grade, on the expiry of his leave on 14th July 1933, posted to Sivapuram

range, Kurnool West division. 2. Mr. T. Sreeramulu Nayudu, Ranger Seventh grade, on relief by No. 1 posted for special duty in Vempalle range. North Cuddapah division vice ranger Mr. Abdul Rahim Khan.

30—6—33. Mr. V. T. Staggs, Ranger First grade, on expiry of his leave on 8-7-33 posted to Kodur range, Cuddapah South division. 2. Mr Abdul Rahim Khan, Ranger Fifth grade Kodur range, on relief by No. 1 posted to special duty, Vontimitta range, Cuddapah North division.

30—6—33. Mr. T. M. Kristnamachari, Ranger Seventh grade, Bukkapatnam range, Anantapur division granted leave on average pay for the date of relief. 2. Mr. N. Rajagopal Chetty, Ranger Sixth grade on expiry of his leave on 12-7-33 posted to Bukkapatnam range.

30—6—33. Mr. T. Sreeramulu Naidu, Ranger Seventh grade on relief of Sivapuram range posted to special duty Kurnool South division.

Working Plans Circle.

12—4—33. Mr. K. Poovappa, Ranger Seventh grade attached to the Tinnevelly Working Plans division is granted leave on average pay for four months from 1-5-1933 or date of relief.

Salem Circle.

10—4—33. Mr. C. Karunakara Menon, Ranger Fourth grade granted leave on half average pay for three months and 29 days from 5-2-4933 to 2-6-1933.

11—4—33. 1. Mohammad Gulam Dastagiri Saheb, Range Officer, Tiruvannamalai range, East Vellore division, granted leave on average pay on medical certificate for three months. 2. Mr. P. Halasyanatha Ayyar, approved Forester, North Salem division, appointed to act as range Officer, Denkanikota West range. 3. Mr. R. Manikkam Pillai, Range Officer, Denkanikota West range on relief by No. 2. posted to Tiruvannamalai range, vice No. 1. to join expeditiously.

26—5—33. Mr. C. Karunakara Menon, Ranger Fourth grade, on return from leave on 3-6-1933, posted to Shevaroys North range, Central Salem division. 2. Mr. M Muthuswami Ayyar, Ranger First grade, granted leave on average pay for $3\frac{1}{2}$ months and leave on half average pay 15 days, from date of relief .3. Mr. C. N. Narasimha Chariar, Range Officer, Shevaroys North will relive No. 2 and hold charge of both ranges till the return of No. 1 from leave when he will hand over charge of the Shevaroys North range and retain charge of the Atur range.

5—5—33. Mr. T. K. Parthasarathy Ayyanger, Ranger Sixth grade Temporary, on the expiry of leave on 7-5-1933 posted to Rasipur range, South Salem division in relief of ranger J. S. Vedanayagam proceeding on leave.

21—5—33. Mr. S. Ramalinga Ayyar, Ranger Seventh grade, on special duty in West Vellore division, appointed Junior Instructor Vernacular Training School, 1933 Session. to be held at Denkanikota tn North Salem division from 1st June 1933.

5—6—33 1. Mr. B. S. Ramaswami Ayyar, Ranger Fifth grade, Cauveri range, Central Salem division, transferred to Harur range. 2. Mr. R. Thangavelu Pillai. Ranger Seventh grade, Harur range, on relief by No. 1. posted Cauveri range.

9—6—33. Mr. M. Muthuswami Ayyar, Ranger Second grade, granted leave on average pay foı 4 months from date of relief.

9—6—33, Mr. J. S. Vedanayagam, Ranger Seventh grade Rasipur range, South Salem division, granted leave on average pay for 2 months and 21 days from 15-5-1933 to 4-8-1933.

Coimbatore Circle.

22—4—33. 1. Mr. U. Vridachallam Pillai, Ranger Fourth S. P. T. on expiry of the 2 months leave from 4-4-1933 A. N. will rejoin South Coimbatore division and relieve ranger C. Thiruvengadam Pillai. 2. Mr. C. Thiruvengodam Pillai, Ranger Fifth grade, South Coimbatore division, on relief by No. 1. transferred to North Coimbatore division.

27—4—33. Mr. C. Thiruvengadam Pillai Ranger Fifth grade on relief in South Coimbatore division posted to the charge of Mettupalayam range, Mettupalayam. 2. M. Gopalswami Naidu M. R. H. Forester First grade on relief by No. 1 will remain in Mettupalayam range and work under the orders of the range Officer.

13—6—33. Ranger Officer Mr. U. Vridachalam Pillai posted to Ulandi to relieve Range Officer Mr. A. R. Manuals, being granted leave from date of relief.

20—6—33. Mr. C. Thiruvengadam Pillai Ranger Fifth grade posted to Mettupalayam range. 2. Mr. K. K. Appiah Ranger Fifth grade to be attached to Mettupalayam range uatil further orders.

22—6—33. Range Officer Mr. A. R. Manuals will rejoin duty in Tunacadavu range, and take charge or the range during the absence of Ranger Mr. T .D. Ponniah on one month's leave. Ranger Mr. T. D. Ponniah granted one month's leave on average pay.

Ootacamund Circle.

7—4—33. Mr. K. R. Krishnan Nair, Ranger Second grade Nilambur division, posted to be Senior Instructor of the Vernacular Training School, for the 1933 session to be held in Palghat divi sion from 1st May 1933 to join duty at Palghat on or abou 15-4-1933. 2. Mr. K. Kunhiraman Menon, Ranger Sixth grad-

in charge of Mannarghat range, posted to be Junior Instructor. 3. Mr. V. N. Parthasarathi, Acting Ranger Seventh grade, posted to Mannarghat range, Palghat division (vice No.2.)

15—4—33. Mr. M. P. Subbayya, Ranger Fifth grade in charge of Begur range, Wynaad division, is granted leave on average pay on medical certificate for two months from 23rd March 1933. 2. Mr. C. Sankunni, Ranger First grade, posted to the charge of Begur range, wynaad division (vice No.1.)

26—4—33. Mr. R. Alagiriswamy Naidu, Ranger, Fourth grade, Coonoor range granted leave on average pay without medical certificate for four months from date of relief. 2. Mr. M. P. Subbayya, Ranger, Fifth grade, on expiry of his leave posted to Coonoor range, The Nilgiris division (vice No.1.)

16—5—33. Mr. M. N. Raman Pillai, Ranger Third grade, doing special duty in North Mangalore division posted to Nilambur division for general duty at the District Forest Officer's disposal.

20—5—33. Mr. K. Raghavan, Ranger, on relief from the Tinnevelly Woking Plan division transferred to Kollegal Working Plan division for work in North Salem. He should report for duty at Hosur before Mr. Krishnaswamy Iyer, Assistant Working Plans Officer.

4—6—33. Mr. Thomas Thatchil, Ranger Second grade (Temporary) Segur range, The Nilgiris Division, granted leave for four months from date of relief. 2. Mr. M. N. Raman Pillai, Ranger Third grade, doing special duty in North Mangalore division posted to Segur range. 3. Mr. V. N. Parthasarathy, Acting Ranger Seventh grade, Palghat division, on relief from Mannarghat range charge, posted to Nilambur division for general duty at the District Forest Officer's disposal.

10—6—33. Mr. K. Dooma Shetty, Ranger Fifth grade, Coondapur range, granted leave on average pay for four months from the date of relief. 2. Mr. Rama Rao Kini, Ranger Fourth grade (Temporary) on special duty in South Mangalore division posted to Mangalore range, North Mangalore division. 3. Mr. S. V. Doraiswamy Ayyar, Ranger Fifth grade (Temporary) now in charge of Mangalore range, posted to Coondaupr range on relief by No. 2.

13—6—33. 2. Mr V. Veeraswamy Naidu, Ranger Seventh grade (Temporary) (who was relieved from Kasaragod Range on the fornoon of 8th June 1933) posted back to Nilambur divition for special duty as Assistant Range officer, Nilambur, or as the District Forest Officer may find convenient.

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